

Residential Weatherization Sub-Regional Meetings Summary

Bonneville Power Administration Residential Sector, 2012

Executive Summary:

Weatherization is highly valued by most utilities across the region. Many utilities inspect nearly 100% of their weatherization projects and consider their programs an important way to connect with their customers. Overall, utilities want to be able to continue to offer weatherization to their customers and made a strong appeal to keep program details simple wherever possible and affordable. Utilities voiced concern that if the specifications are too complex, weatherization contractors might bypass the utilities and go directly to customers to perform sub-par work. Many utilities expressed concern that they might experience a decrease in weatherization projects, decreases in energy savings, and deteriorating contractor and customer relationships. Some participants questioned their ability to implement the new specifications in their territories due to increased requirements, cost, risk, and communicating complexity to contractors.

Throughout the region, utilities offered ideas for new measures, requirements development, regional collaboration and standardized tools and trainings. Below are some of the overarching barriers that were identified:

- Concern that savings, incentives, increased costs and benefits may *not* be fully represented in new measure sets
- Increased complexity of requirements for staff, do-it-yourselfers (DIY's) and contractors
- Requirements that don't line up with traditional contractor roles
- Increased time and operational steps for staff
- Customer or contractor perception of the utility enforcing code requirements
- Increase of liability and risk for utilities and contractors to implement health, safety and documentation requirements
- Some of the specification language/terms are unclear or undefined

The main requests of utilities were:

- Create simplified requirements, tools and trainings that connect customer, contractor, utility and BPA
- Provide a measure set that is representative of costs, savings and benefits
- Provide BPA reimbursement levels that reflect increased cost, savings, benefits
- Remove references to program elements not directly associated with energy efficiency savings (i.e. code references, documentation needs, health and safety)

Sub-Regional Process:

In August 2011, the Regional Technical Forum (RTF) approved an updated version of the Residential Weatherization Specification for the Northwest, to replace the version last updated by the RTF in 2006. Some Bonneville Power Administration (BPA) utilities voiced concern about impacts of the specification on utility weatherization programs. To move forward with the most benefit and the least amount of negative impact, BPA began an engagement with utility customers to identify issues, solutions and needs as well as the role BPA should play in supporting weatherization efforts.

Members of the BPA residential team spent the month of June 2012 discussing the 2011 RTF Weatherization Specification at six utility-hosted sub-regional meetings. These meetings provided utilities a chance to provide candid feedback directly to BPA.

Each meeting followed the same format: an overview of the process, followed by a detailed discussion of the weatherization specification and potential impacts, identification of barriers and possible solutions, and finally a voting exercise indicating areas for BPA to focus support (and areas to avoid). Notes from each meeting were collected, returned back to participants for comment and then compiled to provide a summary of feedback captured at these meetings.

BPA Presenters:

Brian Zoeller, Program Manager, Residential Weatherization (*All meetings*)
Sarah F. Moore, Residential Sector Lead (*Eugene, Missoula, Spokane, Shelton*)
Brent Barclay, Programs Manager (*Idaho, Tri-Cities*)
Assisted by BPA Energy Efficiency Representatives

DATE	Sub-region	LOCATION
Monday, June 4, 2012	Oregon	Lane Electric - Eugene , OR
Wednesday, June 6, 2012	Idaho	United Electric - Heyburn , ID
Tuesday, June 12, 2012	Montana	Missoula Electric – Missoula , MT
Friday, June 15, 2012	Eastern Washington	Inland Power & Light- Spokane , WA
Thursday, June 21, 2012	Eastern Oregon/WA	Franklin PUD - Tri Cities , WA
Thursday, June 28, 2012	Western Washington	Mason County #3 - Shelton , WA

Goals of Sub-Regional Meetings:

1. Provide utilities an opportunity to discuss weatherization program priorities with BPA and provide feedback on the proposed 2011 RTF Residential Weatherization Specification
2. Identify tactical weatherization barriers and discuss program impacts
3. Identify potential solutions and prioritize needed tools and training

Value of Weatherization to Utilities

Participants were asked what they valued about their weatherization (Wx) programs. We heard many similar themes across the region. These have been condensed down to five general categories; Customer relationship/satisfaction, real energy savings, customer education, non-energy benefits, and contractor delivery elements.

Customer relationship/satisfaction value:

- Weatherization programs provide a great way to give some of value to customers
- 100% inspection helps with positive customer interaction
- Weatherization is relatively cheap energy efficiency that members value
- Provides durable energy efficiency measures for homeowners

Real energy savings:

- Weatherization lowers bills for those who are least capable of paying
- Energy efficiency can be viewed as a resource rather than a social program and utilities can benefit from knowing the difference between the approaches
- The utility benefits from winter peak reduction through “durable conservation” or longer measure life; helpful in avoiding Tier 2 prices

Customer education opportunities:

- Customers often don’t understand what the level of efficiency is in their homes; we can help them to be in a better situation
- Weatherization is an opportunity to educate customers beyond just energy savings and bill reductions
- One-on-one time with a customer gets you in the door to see what else you can do to help customers
- Good as a first step with other popular measures like windows and ductless heat pumps

Non-energy benefits:

- Appreciate not enforcing code to do Wx, yet the Wx program provides an opportunity to address building code issues
- Weatherization program is a win-win-win for Utility/BPA, Contractors and Customers; it is an economic development opportunity and has local stimulus elements
- An affordable way to improve health, increase durability, reduce operating costs

Contractor delivery elements

- Utility is the line of defense between contractor and customer to ensure quality implementation
- Good contractors make the utility job easier
- Enjoy the camaraderie in the EE and utility field to work towards consistency across regions

New Measures

Several new measures were suggested by various sub-regional groups. Below is a list of those talked about that relate to residential weatherization activity in existing homes.

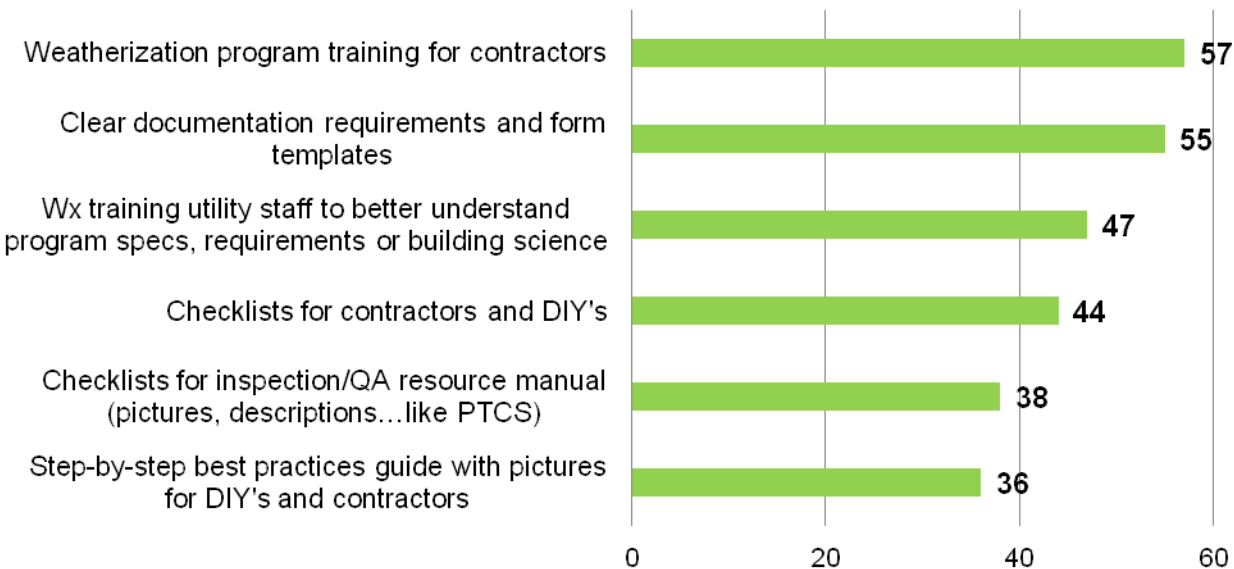
- Prescriptive duct sealing and duct insulation as a separate measure(s) from attic or floor insulation
- Insulated doors (no glazing) for residential and commercial (small saver)
- Skylights & wood-framed windows (older, single pane wood windows are already acceptable)
- T-8 fluorescent lighting fixtures (small saver)
- Programmable thermostats (single family)
- Ductless heat pumps that utilize existing ducting systems in manufactured homes.
- BPA reimbursement for Energy Audits
- Reimbursement incentives to help contractors acquire trade tools such as blower doors, duct blasters, infrared testing equipment, etc...
- Mobile home decommissioning and efficient replacement that emphasizes equal or smaller home sizes than those decommissioned to ensure savings
- Spray foam retrofit measure that considers the additional benefits of air sealing and insulation

Prioritization Exercise Results

BPA identified thirteen ideas to discuss with utility representatives (in advance). These thirteen ideas were presented in the same format at all six workshops with the invitation for participants to suggest additional options which are listed below. Participants wrote down these options on their sheets and BPA also wrote their options on the board as one to select from. Participants were then given six green dots and six red dots. (Exception: Eugene had five green dots and no red dots: The Dalles used O's and X's on paper to indicate good and bad ideas). Participants were requested to place their green dots next to ideas they would prioritize as needs (as many as six on one idea or spread out among several) and six red dots next to ideas seen as not useful or ideas they did not want BPA involved in. The items with the most dots and the least dots offered some valuable insight. The results below suggest utilities are looking for clear, useful templates, tools and training to meet clear requirements that link their contractors, customers, the utility and BPA together.

Top 6 Most Popular Regional Ideas

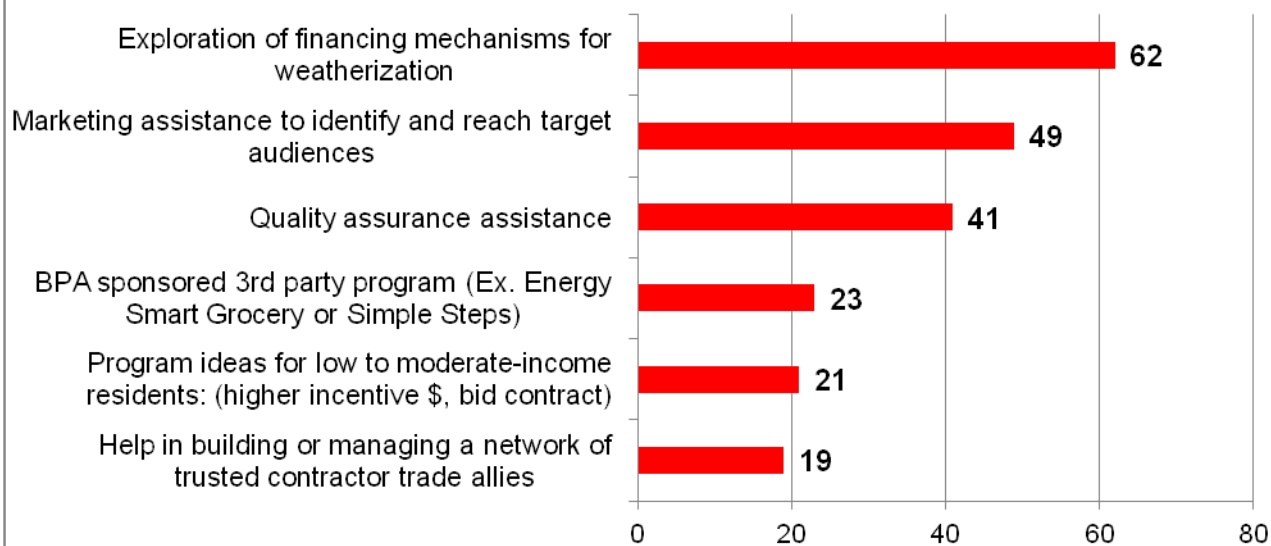
(based on # of dots assigned in prioritization exercise)



Conversely, the exercise also indicates that many utilities want maintain the customer touch point through weatherization and they do not want overarching program elements led by BPA. Rather, they want to manage their contractors, inspection process, marketing and financing of Wx themselves and as they see fit.

Top 6 Least Popular Regional Ideas

(based on # of dots assigned in prioritization exercise)



Overarching Issues and Solutions

The information provided below is a compilation of notes captured at all of the sub-regional meetings. Patterns of issues and the solutions identified are highlighted. Issues lacking a proposed solution either did not have a proposed solution, is yet to be identified, or we failed to capture it.

Format and Organization	
Identified Issues & Barriers	Proposed Solutions
Prescriptive and whole house air sealing is confusing for people to understand.	Separate the prescriptive air sealing section from the whole house air sealing section.
Contractors were mentioned to have varying levels of experience and some won't be able to easily decipher the specs or read the specs very well. This might especially be an issue for DIY's and multi-lingual contractors. Pictures/diagrams would be good to help contractors and DIY's. Good examples of requirements and spec documents are out there.	Create an easy to read requirements document and/or best practice guide with photos showing critical spec details. Insert details and diagrams into requirements; use pictures. Assemble a resource library of videos, books, diagrams, etc. Consider Spanish versions.
Use of checklists would be helpful in many cases (not just for air sealing).	Create checklists for areas where it makes sense: air sealing, spot ventilation, duct sealing. Checklists should reference specs/requirements.
BPA Implementation Manual Change Notices have sometimes been vague. Program information and tools are often not provided at the same time as the BPA IM Change Notice.	Be explicit in BPA IM Change Notices. Provide tools, aids, details before or at the same time as the BPA IM Change Notice.
Code references are not linked to anything tangible and code references still exist in the document. Utilities do not want to enforce code nor be perceived as enforcing code; they just want to know where to find code particulars.	Provide a Web-link to code documents for each state within document. Remove code language from spec.
The use of roman numerals, punctuation , and section & sub-section headings do not always follow a consistent format; this makes the document difficult to read and navigate.	Re-format the RTF spec or BPA requirements document to be consistent and have it proofread by utilities.

Language and Definitions	
Identified Issues & Barriers	Proposed Solutions
There is no appendix ; terms are not defined consistently.	Work with RTF to identify terms and add definitions appendix.
<p>Human Contact Area is poorly defined. Is it only in conditioned spaces? Areas commonly walked through or accessed? Areas where there is a safety issue?</p> <p>Human Contact Areas are inconsistent - Page 8. #10b: Why is the access hatch insulation required to be covered with an air barrier since this is not a normal human contact area? In addition, if it is required here in case of contact as the hatch is opened, why is it not required on batt insulation surrounding the opening (Page 8, #10c, II)? This is inconsistent and does not match with code intent.</p> <p>This issue comes up again on Page 13, #5a, once again not considered an area of human contact. This issue is specifically addressed on Page 9, #13d, where a knee wall is used as storage and therefore is a human contact area for fibrous insulation.</p> <p>Some prefer this definition to remain vague (should over shall). Others want this to be defined; not left to interpretation between spec, utility, BPA and/or contractor.</p>	<p>Define Human Contact Area for all involved so everyone works off the same definition.</p> <p>Define human contact area to be in line with general homeowner access and frequency.</p> <p>Redefine Human Contact areas and promote consistency throughout the specs.</p>
" Electrically Heated home " is too loosely defined.	Consider a clearer/tighter definition; be consistent with the BPA Implementation Manual.
<p>Terms manufactured home vs. a mobile vs. a modular vs. HUD are used inconsistently. For example: think of all the different types, potentially transportable vs. road worthy. What if the tongue and axels are removed? Is it still a mobile or is it now stick built?</p> <p>Page 11: Definition of manufactured home. How does a modular home differ from the second paragraph? Currently they are allowed as site built since they are on a permanent foundation and built as a site built home. Is there is a way to specifically differentiate?</p>	<p>Revise language to better describe each home type definition in BPA's requirements.</p> <p>Consider a definition that includes: "if it has a chassis", then it falls into the manufactured home category. If it does <i>not</i> have a chassis, it is considered single family site built.</p>
" Flame-spread rated " not clearly defined. Some participants questioned if flame-spread rated materials are available in their territories and at what cost.	Identify which general materials are flame-spread rated and check on availability of materials.

Unclear if common materials meet code in each state. For example, does house wrap/Tyvek meet thermal, ignition and flame spread requirements? This is another step for utilities and contractors to research.	Outline in spec material section which example materials may be used.
The language is vague describing manufactured home accessibility/ inaccessibility of ventilation systems access in attic space. Similar language issue describing penetrations in site built attics and plumbing penetrations.	Improve language for clarity.
Use of Styrofoam plugs : There was confusion around when plugs needed to be foam or of other material, under which circumstances and with which type of structure: Manufactured or Site Built.	Create clarity in language and requirements for plugs under different conditions and different housing types.
The Combustion Appliance Exhaust Ventilation Inspection section is confusing (Pg. 4, Section 3). Point C – “Informing homeowners of issues” section is tough to do because utilities aren’t code inspectors or combustion technicians and this puts liability onto electric utilities.	Train contractors to perform this task appropriately. Remove this requirement and put language in IAQ literature. On page 5, Section D is covered by E and could merge with B to simplify language and understanding.
What is meant by “protected by an overhang ”? This is rather nebulous. Page 25, #5:	Provide a diagram/detail to help determine when it is protected from the weather and when it is not.
The specs would be difficult to read by contractors, most of whom are minimum wage workers. Many utility staff are also not adept in spec language.	Create and/or bring back existing Wx training videos that reflect the specs. Create simple spec language with details, pictures to accompany.
The definition of Multifamily on page 1 is different than the current BPA Implementation Manual.	Align the Multifamily section with the Manual and with state codes.
General Requirements	
Identified Issues & Barriers	Proposed Solutions
The new spec requires multiple contractor trades to do multiple jobs. An attic or floor measure may require insulating, air sealing, plumbing, duct sealing, duct insulating as an example. Too many involved contractors could cause	Reassess measure requirements to be cognizant of contractor traditional roles to promote more activity at cheaper cost. Separate out air sealing from insulation and make it voluntary

<p>complexity and raise cost on a single measure.</p> <p>The choice of installers can be very limited in some utility areas. Longevity for contractors in the profession or in the region is in question.</p> <p>In some areas, weatherization specialists can perform air & duct sealing, insulation, PTCS etc... and are certified with credentials; in less populated areas off of the I-5 corridor, the weatherization specialist is the exception.</p>	<p>(with extra incentive).</p> <p>Separate out duct sealing and duct insulation.</p> <p>Train contractors to perform multiple roles and work across territories to keep trusted contractors performing good work.</p> <p>Provide two-tier system with higher incentives for higher, integrated measures to reward.</p>
<p>Spec does not have a measure set that represents the additional incremental costs, potential benefits and incremental savings.</p> <p>The spec requires safety and health costs that many fear will not be absorbed by the measure set or may lead to a less cost effective measure.</p> <p>Overall, the new specs introduce increased costs that affect their target customers; low income, working poor, seniors, and DIY's. Expense examples are expensive CO monitors, air sealing labor (with no savings), HVAC work on spot ventilation, house wraps, duct insulation</p>	<p>Create a representative measure set including health, safety and durability labor and material costs on a measure by measure basis with realistic savings (with air sealing) and benefits. Increase BPA Willingness to Pay</p> <p>Create two-tiered option</p> <p>Work with local officials, to perform outreach, education; build demand and blitz areas with trained contractors.</p> <p>Unbundle measures into unique components to capture savings and provide more options</p>
<p>How will requirements be judged by BPA staff when there's so much variability in a home's existing vs. installed state? For instance, there is existing insulation in an attic and it is pulled back or removed to air seal. Utilities document issues in different ways that may not be what BPA needs</p> <p>Contractors need more guidance in what is right and proper and something to hold them accountable.</p> <p>The specs seemed very prescriptive. How do utilities handle unique circumstance inspections in houses that do not fit?</p> <p>How are contractors and utilities supposed to accurately document pre-existing conditions?</p>	<p>BPA program staff to work with inspection staff to define criteria and create tools and processes that connect all in the value chain; provide room to document nuances.</p> <p>Provide good incentives that garner interest in following the rules and staying with the utility program.</p>
<p>Most are ok with 25% inspection rate because they exceed it for their membership reasons; however, the larger utilities who perform more jobs would like to see less. It was noted that PTCS is at</p>	<p>Consider 25% to a certain number of jobs and then 10% when volume exceeds that number monthly.</p>

10%.	Provide best practice QA design for new and problem contractors.
<p>The Inspection Exam, (if open book) does not appear to be an issue for this group, however some questioned the necessity and if there is a time limit.</p> <p>What if a utility isn't offering all the measures or is only offering a few like attic insulation and windows/doors?</p> <p>Appears to be programmatic over-reach.</p>	<p>Consider eliminating as it may not be valuable or applicable.</p> <p>Provide more refinement of test structure and parameters; different versions for windows, insulation, whole house air sealing.</p>
<p>Utility inspection requirements appear difficult to do properly, especially with air sealing.</p> <p>Are utility inspectors going to have to dig around in insulation to check?</p> <p>Will prescriptive air sealing create an in-process inspection? Time is already short and the increasing degree of difficulty has both utility and contractor viewing weatherization as unattractive, especially when great distances are involved.</p>	<p>Provide quality inspection training for how to inspect and what is expected.</p> <p>Have multiple utilities work with trusted, roving contractors.</p> <p>Produce tools that simplify the spec requirements and devise checklists to reduce staff burdens, yet keep contractors honest.</p> <p>Outsource to 3rd parties who specialize or work with existing pooling groups and their contractor networks.</p>
<p>Installation certificate seems unnecessary because the few that are interested in the information will call the utility for it anyway. The contractors bid form already much of this information. Smells of program delivery and outside the role of a spec.</p> <p>Some saw this as another sticker will clutter up an electric box or may cause confusion for customers. Where will the sticker be placed? Who will provide the sticker? Who fills it in, what about the durability of the sticker over time?</p> <p>I-937 audits require some of this information for affected utilities. What contractors provide must match up I-937 provisions. Viewed as another piece of paper one has to fill out.</p> <p>Some saw value in knowing the information but some also question the value and requirement of handing it to a customer and by whom?</p>	<p>Eliminate the customer installation certificate and provide BPA what they need for their records; a best-practice</p> <p>Reconcile form with I-937 information.</p> <p>Utilize a triplicate form which a customer receives a copy of and provides BPA with what it requires.</p> <p>BPA may provide a template for what is required to aid programs, BPA staff, contractors and customers be on the same page.</p>
<p>Indoor Air Quality and EPA document was viewed as long, not updated, and programmatic in nature. IAQ signature doesn't seem necessary.</p>	<p>Fold in the EPA doc link into the IAQ document and do not require a signature but do require that it be</p>

<p>There is concern about liability associated with a signature by the customer.</p> <p>Who would be required to sign (renter, owner; family member). Who would provide it? Contractor or utility? Which contractor?</p> <p>However good the information, it is a lot to read and distribute. The EPA document link doesn't work. The date is 2008. Is there a better, slimmer, newer version?</p> <p>Who would pay for it and produce the copies? Is it necessary for all measures?</p>	<p>part of the utility process.</p> <p>Leave as a best-practice and to the discretion of the utility.</p> <p>Have a check-off that states a customer received it as part of the utilities own process.</p> <p>Allow utilities to customize this form and the IAQ document and proper link</p> <p>Create a process where the Lead, EPA and IAQ documents/links are all in one place.</p>
<p>Utilities have an inability to use admin budgets for incentive dollars.</p>	<p>Look into the possibility of allowing admin budgets to be utilized for measure incentives.</p>
<p>CO monitor spec is overly detailed and confusing.</p> <p>CO monitor requirements for any measure beyond Whole House Air Sealing caused deep concern. They asked why no code organization required a CO monitor in existing construction.</p> <p>Many utilities worry about being required to install from a liability perspective. Should an electric utility also inspect a fire extinguisher? Some feel if something did happen, is there liability for not having required a CO monitor?</p> <p>Why can't any UL approved unit work just as code requires? This is not nearly as complex as PTCS requirements.</p> <p>CO Monitor – Who installs it? Insulator, air sealer, window installer? This will cost \$60 plus and eat up needed incentive money.</p> <p>Is there incremental cost coverage in the measure set?</p>	<p>Revise wording in CO Monitor section.</p> <p>Place CO Monitor information in IAQ information; encourage but leave as best practice</p> <p>Require for Whole House air sealing; Merge type with PTCS.</p> <p>Responsibility on customers to purchase.</p> <p>Incorporate CO monitor information with IAQ forms into existing utility process with BPA/RTF language template, resources.</p> <p>Bulk purchasing by BPA could bring down the cost and increase availability.</p>
<p>There is liability in having an electrician signing off on insulating over Knob and Tube. Why would someone do that if they didn't get the job to replace it?</p> <p>Knob and Tube is a liability issue to the utility and none believed an electrician would sign off on knob and tube wiring being safe to insulate over.</p>	<p>Create practice guides to help insulators prepare knob and tube wiring.</p> <p>Disallow insulation jobs until active knob and tube is replaced</p> <p>Leave in the spec.</p>

Knob and tube issues were not seen as impediments; some participating utilities already tell their members to remedy the issues before they perform a measure.	
<p>Combustion Appliance Exhaust Ventilation Inspection is poorly organized. Intent is good.</p> <p>Does this apply to all measures or just to whole house air sealing? It isn't quite clear.</p> <p>Some utilities stated that they would simply avoid these jobs and not pay incentives unless it was fixed.</p> <p>Can one expect an air sealer or window installer to make this type of determination? Are they trained /qualified to do so? A visual inspection may not be enough; especially with the untrained eye that may not be able to see vents in certain circumstances. This puts liability onto the electric utility and/or contractor.</p> <p>Some felt this was a slippery slope to code enforcement by the utility and its contractors.</p>	<p>Exclude from measures except WH Air Sealing and leave in IAQ literature.</p> <p>Leave to individual utilities to identify what should be done with the right professionals capable of determining combustion devices.</p> <p>Eliminate this from certain contractors like window and door installers and possibly one-measure insulators.</p> <p>Develop a more basic set of CO monitor specs (including 30 ppm to avoid false alarms.</p> <p>Align with PTCS.</p>

Attic, Floor and Wall Insulation

Identified Issues & Barriers	Proposed Solutions
<p>Prescriptive Air Sealing <i>seemingly</i> has no current savings attached yet it can be very labor intensive; should be an attempt to get 80% of the holes sealed where as the last ~20% is increasingly expensive, time consuming and unlikely cost-effective.</p> <p>Some penetrations are quite difficult to identify, such as electrical penetrations in a roof structure.</p> <p>Issue of insulation around top plates is not clear and needs more definition. Five inches in any case or just when top plates are covered?</p> <p>Finding all penetrations disrupts and degrades current insulation R-value if insulation exists.</p> <p>The meaning of "all accessible penetrations" and what that means to contractors, BPA program staff and COTR's will vary. Some want very explicit definitions while others want to see the discretion left to contractors or the utility.</p>	<p>Find the cost-effective tipping point where air sealing provides energy saving benefits and considers contractor's time in the measure.</p> <p>BPA Qualify a prescriptive air sealing measure if it believes there are savings and seek a deemed measure.</p> <p>Align BPA requirements, checklists, tools with BPA staff checklists to remove ambiguity</p> <p>Provide clear definitions of accessible and inaccessible and when it is NOT cost-effective to do air sealing; under what conditions.</p> <p>Include contractor checklists /forms / signatures that confirm contractors</p>

<p>Air sealing contractors hardly exist and there is question of savings and cost coverage in parts of the region. Several questioned value of air sealing when insulation already exists.</p> <p>For utilities in these areas, pre and post audit may require 100 miles of travel each way, each time. Utility management won't allow such inefficiencies.</p>	<p>did what they said they did; hold them accountable. Have them match what Inspectors look for.</p> <p>Look for inspection models that don't require utility staff at every site for pre, in-process, post inspection</p>
<p>Duct sealing and duct insulation should be their own measures; especially if they do not receive incremental costs and savings in the attic and floor insulation measures.</p> <p>Duct sealing as a part of prescriptive can be seen as opening up a Pandora's box with complicated cases; one is better off doing PTCS.</p> <p>Short duct runs don't qualify for PTCS or they may not be leaky, yet sealing and insulating them is still required for an insulation measure? How does that work?</p> <p>The cost to insulate ducts individually may increase costs an extra \$600-\$700.</p> <p>Issue of training insulators to perform duct sealing and duct insulation. Is it a natural fit?</p> <p>An R-11 wrap around ducts is expensive for rigid. It's cheaper and easier to do R-8 flex duct but also less effective in heating and as a rodent barrier.</p>	<p>Separate Duct Sealing and/or Duct Insulation as individual measures outside of any attic or floor insulation measure. BPA Qualify them.</p> <p>Align with PTCS</p> <p>Promote business opportunity for duct sealing and duct insulation.</p> <p>Programs can prioritize measures or put contingencies on them to ensure they are implemented as they see fit (ex... requiring attic insulation before windows).</p> <p>Create a small saver pipe insulation measure.</p>
<p>Manufactured home duct sealing with floor insulation seems punitive, especially if no savings are attached in measure set.</p> <p>Duct sealing as a prescriptive measure may take away from potential PTCS savings in the future.</p> <p>Manufactured home underbelly insulation and duct sealing/insulation are seen as two different measures and a real opportunity in some regions.</p> <p>One participant provided a method to insulate and seal an underbelly.</p> <p>Inconsistencies were found in sections HVAC Duct Sealing - D.1E and D.2 surrounding Flame Spread requirements, insulation requirements in F (frequencies of traps/per foot? And when one needs rigid board) and H (does flexible crossover duct need</p>	<p>Create separate measures for duct sealing and/or duct insulation.</p> <p>Utilize RBSA to identify ducting linear feet to create a new measure for insulation/and or sealing.</p> <p>Share knowledge about proper underbelly insulation among utilities. Create materials and trainings to show how to best seal and insulate underbelly's.</p> <p>Refine specs to spell out each section clearly and ensure consistency with other sections.</p>

an insulation value?).	
<p>Cross-over duct in manufactured homes requires replacement with rigid metal if current duct is in poor condition. PTCS does not have this requirement, (R-8 and any duct type)</p> <p>Question: If one replaces with insulated flex duct, do we lose savings?</p> <p>How do you know if something is R-3 or less? (The spec says: If less than R-4, then one must insulate a duct to R-11 D.2E).</p>	<p>Align with PTCS.</p> <p>Allow flexible insulated duct and keep rigid ducting as a best practice.</p> <p>Investigate with RTF if by using flex ducting leads to savings loss.</p> <p>BPA to investigate if this is true from an HVAC perspective.</p>
In Manufactured homes, if a rodent barrier is not present, does one have to be installed?	Confirm with RTF.
Ventilation in crawl space – if one is in a dry (climate), one can decrease ventilation openings to 1/1500 if OK'd according to WA code.	Remove and defer to code. P. 16
<p>Consumer education is lacking to grasp why duct sealing/air sealing is important.</p> <p>Contractors don't have the skill sets or the tools to sell air sealing (or duct sealing for that matter).</p>	<p>Develop sales tools for Utilities and contractors to describe why sealing is done.</p> <p>Tier incentives to encourage insulation <i>plus</i> air sealing.</p> <p>Train contractors in air and duct sealing.</p>
Walls Between Conditioned Space and Under-floor Spaces - Page 14, #7: Why is this different from the requirements on Page 8, #13? They describe the same circumstance.	Consider keeping them the same since the application would require the same standards.
Wall Insulation - This paragraph has the potential to cause serious issues with durability depending on the installation location and characteristics of the insulation and perm rating of the vapor retarder. Due to the varying climates throughout the NW, it is impossible to have one vapor retarder installation specification that works in all regions. Page 19, #1c:	Recommend following the 2009 IRC requirements for this issue. It provides climate zones, takes into account insulated sheathing options, and the different vapor retarder classes that exist.
With any hatch , especially with pull downstairs, should their not be a latch to ensure a proper closure?	Consider adding latch language to specs where they exist.
Below grade wall insulation and vapor retarder provisions in the spec was never seen before in real homes by the Eugene group.	Consider removing this provision from requirements or spec.
Walls in Attic Areas - The spec requires upgrading of insulation in the walls but is there additional savings and rebate? This is a major change from the previous requirements which state that if it is	Check with RTF to identify if savings are there and if BPA does/is able to reimburse homeowner.

currently un-insulated, it must be insulated (and can be rebated). Page 8, #13a and b	
Using foam-based insulation has very good air sealing qualities. Should there be similar requirements for health reasons as whole house air sealing requires when an existing home is foam sealed/insulated?	Leave to utilities at this time since so few homes are fully foam sealed in existing homes Add to best practices
Interior Access Doors - Page 8, #10c, I and II: Foam board is not allowed for framing openings. The question is why? It is allowed on Page 6, #4 for damming of insulation and this would be a similar application.	Allow foam board, plywood, or OSB, but require foam board to be at least one inch in thickness for rigidity and strength and nailed to the attic framing member so it cannot shift.
Page 10, #20c: Why is rigid board specified for interior roof insulation ? #20a has it correct: as long as it is air-impermeable, it is ok.	Change c) to an in-progress inspection to evaluate final r value, installation, and air sealing and leave the type of insulation out of it.
Foam gaskets are missing from the prescriptive checklist: example – behind light switches.	Add foam gaskets where they typically are placed.

Windows and Doors

Identified Issues & Barriers	Proposed Solutions
Are there savings attributed to window screens ?	Remove window screens as a requirement.
Insulated replacement doors are not a measure but are they cost-effective? Why are Energy Star/high efficiency skylights not a replacement measure?	If found cost-effective for NFRC rated doors and skylights from baseline, add the measures to the measure sets. Work to help supply these types of doors and skylights if not locally/regionally available.
There is little clarity with prescriptive air sealing requirements when replacing windows/patio doors . Some questioned why a window installer would be required to check mechanical ventilation or follow the prescriptive air sealing checklist.	Work with RTF to add a separate section to properly air seal and insulate around windows (and doors). Place air sealing requirements in window and door section rather than in air sealing section. Do not require window and door installers to perform venting issues.
There were questions about Egress requirements with safety glazing. Another question was raised about replacing basement windows with larger windows that code requires to meet Egress - will this	When adding basement living space, allow Egress opening with efficient, larger window to meet code.

be allowed for reimbursement?	If performing in conjunction with several window/door replacements, allow Egress enlargement even when not doing to meet code.
<p>Prime Window Replacement - The prohibition on the increase in window square footage has been deleted. This is fantastic but there is no guidance provided as to the square footage that we can rebate on. Page 25</p> <p>If the window opening has weights (un-insulated), can we expand the size of the rough opening without penalty?</p>	<p>Check with RTF to see if measure accounts for expansion or not.</p> <p>Provide for the original size.</p> <p>Credit the homeowner for the whole replacement window, larger or smaller.</p> <p>Credit the homeowner for the size of the original opening.</p>
Windows: Hazardous Locations Requiring Safety glazing section is directly from IRC 2006.	<p>Refer to code statement inserted and leave out</p> <p>Insert easy-to-follow language and details to show safety glazing conditions</p>
Create a measure for old wood-framed double-pane windows .	Investigate creating a double pane wood window measure and insulated door measure.

Whole House Air Sealing

Identified Issues & Barriers	Proposed Solutions
<p>Accessible definitions and top plates: Page 28, f, iii: From an installers view point this appears rather arbitrary and does not make a lot of sense. If there is loose fill insulation present and it is moved to air seal, R-value will not be recovered. (cost is covered for blown-in less than R-11).</p> <p>It can also require more insulation to be laid as some contractors remove all the insulation in an attic. How is that accounted for? R-0 at beginning? From R-what was there? How is that documented?</p> <p>With all the pre and post testing and inspection, this will be a burden on the home owner.</p>	<p>Consider rewriting the specification to say it is not accessible if:</p> <ol style="list-style-type: none"> 1) There is more than three inches of blown insulation (about R10). 2) There is more than one layer of batts installed perpendicular to each other. 3) There is combination of blown and batt insulation.
<p>Utilities did not appear interested in this measure at this time, although one utility expressed interest and many believe it should be offered.</p> <p>Whole House Air Sealing with mechanical ventilation is too difficult of a measure for most</p>	<p>Simplify the measure so newer contractors can digest the information; perhaps a prescriptive air sealing measure.</p> <p>Sponsor training for air sealing and</p>

<p>participating contractors to consider implementing.</p> <p>There have not been a lot of proven savings for this measure.</p> <p>Few will take this measure up but the one or two utilities interested in it need additional incentives and training.</p>	<p>testing to interested utilities/contractors</p> <p>Ensure customers are present for Testing procedures to help them understand air leaks and house as a system.</p> <p>Provide an equipment incentive to help contractors get started.</p>
<p>The Ventilation Calculator is not user-friendly and does not take one all the way through; there appears to be missing steps.</p>	<p>Identify and revise ventilation calculator for usability.</p>
<p>CAZ Failure –Specifications require mechanical air if the cfm50 after air sealing is below certain specifications. However, there is no requirement for fixing a CAZ failure. This could result in death due to carbon monoxide back drafting. Page 32.</p> <p>The current PTCS Duct Sealing class teaches remediation of this problem</p>	<p>Have this requirement added as it appears to be an oversight.</p> <p>CAZ testing should be the role of the installer, not the utility.</p>
<p>Certification - Performance of WH Air Sealing requirement by a PTCS certified contractor is odd since there is no PTCS training for this type of measure, nor by PATS. BPI has a number of certifications. Page 28, #1d.</p>	<p>Specs or BPA Requirements should outline certifications that are relevant.</p>
<p>CAZ testing and a CO Monitor is required for this Wx measure. However, for PTCS, only a CO Monitor is required.</p>	<p>BPA to look at congruency across Wx and PTCS specs to ensure alignment.</p>
<p>Mechanical Ventilation</p>	
<p>Identified Issues & Barriers</p>	<p>Proposed Solutions</p>
<p>What triggers spot ventilation for a particular measure was confusing to this group.</p>	<p>More clearly lay out when spot ventilation is required and for which measures.</p>
<p>Use of the words "In good working order" is vague in referring to fans.</p>	<p>Define "In good working order".</p> <p>Eliminate Ventilation requirement for Windows and Doors measure, put in IAQ document</p> <p>Define when spot ventilation needs to be added and what type of CFM needs to be included.</p>

In the current 2006 specs, one is required to put in a ventilation system with any Wx measure . The current spec does not contain this requirement; rather it requires working spot ventilation. The question arose from whether utilities can get an amendment in the current spec to allow the new ventilation spec in the 2006 spec for manufactured homes.	Amend current spec to remove ventilation requirement and insert spot ventilation requirement instead for 2006 version. Leave as is.
In a structure that lacks a kitchen or bath fan , must one be installed and for which measure(s)? It appears an omission.	Request clarity from the RTF.
Should existing homes have MV synergy with new construction requirements to make it easier for contractors?	BPA to look at if this makes sense across new and existing homes in any way.
Kitchen Fans : there is a question of whether code requires a metal roof jack on kitchen fans. Back draft dampers are not required which in essence creates a 4" hole in the attic. With air sealing requirements and ducting insulation requirements, this doesn't make much sense.	Consider a damper requirement in BPA requirements.
Why do windows in homes require ventilation requirements /adjustments, especially in manufactured homes?	Look to remove ventilation requirements with windows and doors (especially with no or little insulation in most walls).
Ventilation Calculator over-ventilates and under-ventilates depending on one's circumstance.	Use AHRAE 62.2. One mentioned Building Science Corp. recommends design of MV to exceed 62.2 by 50% but program it to 60-70%; educate customer how to control it under conditions.
Idaho code prevents an insulation installer from with exhaust fans unless properly licensed. Thus, to meet the spot ventilation spec (bath and kitchen fan, ducting, roof jack) requires an HVAC license. This adds another contractor to the mix and increases cost to customers in the State.	Investigate with ID code officials and IDEA group to see if Wx contractors can fix/adjust fans, duct systems and jacks to meet spot ventilation spec like in other states.

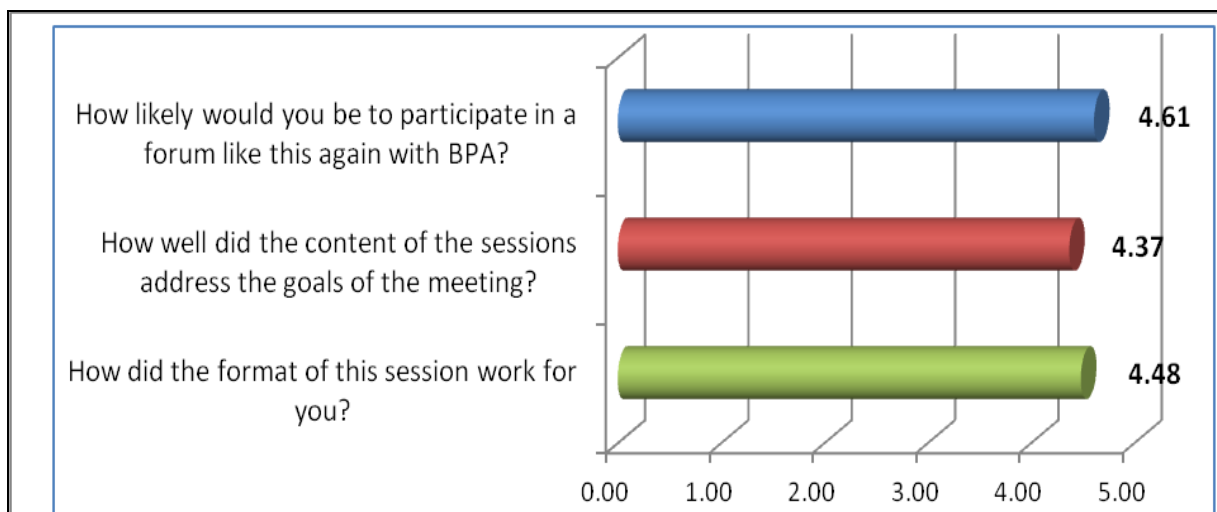
Additional Regional Utility-Led Ideas:

As a result of having utility representatives from bordering territories, sub-regional groups naturally shared ideas and discussed practices that could have larger regional potential, and do not require Bonneville assistance. Several utilities maintain strong contractor relationships that have been cultivated over many years. Several of these same utilities understand that contractor work and utility territories do not often overlap very well. There may be an opportunity to reap the benefits of better consistency in program design.

Ideas to better manage, share, promote and communicate with contractors were raised. Since utilities often use their websites, shared listings of vetted contractors was one idea. Another was a regional program participation agreement to build contractor accountability. Other ideas included quality assurance methods that tracked individual contractors across territories with a goal of promoting work product that is consistent. Creating consistent program requirements and communication would help reduce confusion on the part of contractors about various utility rules. Some utility participants also raised the idea of working more closely with pooling groups, local community leadership for energy efficiency campaigns, and with low income agencies where agencies act as contractor for specific measures. Such ideas were better received among less densely populated territories, where good, trusted contractors are sparse, where driving distances are great and where knowledge is low about whom customers and utilities can safely engage.

Survey Feedback:

Below are the survey results of the sub-regional meetings that provide BPA direction in developing and designing future processes. Results appear to indicate that participants appreciated this format, felt the content met the stated goals and that this format was seen as a productive method for engagement. On a 1 to 5 scale, where 5 is the highest, participants collectively rated the forums in the following manner:



The residential sector would like to thank all utilities and other stakeholders who have contributed suggestions and feedback to date.

Questions, comments or concerns about these notes or the process may be referred to the following contacts or your Energy Efficiency Representative.

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